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# ICR News 2008

## Activity Report of the Global COE Programs

### “International Center for Integrated Research and Advanced Education in Materials Science”



Representative from ICR:

■ Prof. TOKITOH, Norihiro (Director of ICR)

Division of Synthetic Chemistry

—Organoelement Chemistry— →P.4

The Project, granted in the area “Chemistry and Materials Science” for fiscal 2007–2011, is intended to consolidate the over 100 chemistry-related research groups of Kyoto University in Graduate School of Engineering, Graduate School of Science, and Institute for Chemical Research (ICR), covering virtually all the arenas of chemistry from basic to engineering and from molecules to materials, for the ultimate goal of “Integrated Materials Science.”

The main two objectives of this Project are (1) Program in Research: International Center for Integrated Materials Science and (2) Program in Education: A New Breed of Internationally Competent Young Scientists, and we are now forwarding with a variety of sub-projects as follows (the numbers are those for ICR).

- 1) Inter-Field Joint Research Projects (Integration beyond Core Fields)
- 2) Interfaculty Integrated Course Program
- 3) Embryonic Research Project Support (FY2007: 10 Assistant Professors and 9 Students, FY2008: 10 Assistant Professors and 9 Students)
- 4) International Academic Exchange Program: On-the-research Training beyond Borders (FY2007: 3 Assistant Professors, 1 PD and 9 Students, FY2008: 1 Assistant Professors and 10 Students)
- 5) GCOE Post-doctoral fellows and Research Assistants (FY2007: 1 PD and 33 RAs, FY2008: 4 PDs and 33 RAs)
- 6) International Scholarship (FY2007: 7 GCOE-Seminars and Lectureships, FY2008: 9 GCOE Seminars and Lectureships)
- 7) Foreign Graduate Student Internship (FY2007: 0 persons, FY2008: 1 persons)
- 8) International Workshop Initiative (FY2007: 1 events, FY2008: 2 events)

As for the International Academic Exchange Program, in particular, many applications have been made from a variety of research groups in ICR and the qualified young chemists have enjoyed their flexible, short-stay studies abroad (varying from two weeks through three months). Other projects have also been progressed smoothly.

In interdisciplinary collaboration and perhaps in fusion with physics and biology, chemistry and materials science today are thus expected to make fundamental contribution to science per se and to the global society beyond tomorrow. All the members of the COE Project are sincerely determined to create the new paradigm of “Integrated Materials Science” and thereby to cultivate new breeds of young scientists, truly competent, creative, and energetic, who will soon take off from Kyoto University towards international arenas of science and beyond.

## “Center of Excellence for Education and Research on Photonics and Electronics Science and Engineering”



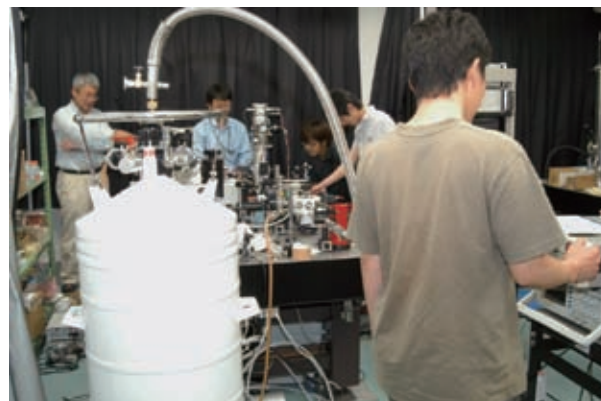
Representative from ICR:

■ Prof KANEMITSU, Yoshihiko

International Research Center for Elements Science  
—Photonic Elements Science— →P.56



In this program, we aim at establishing the COE for “photonics and electronics science and engineering”, to investigate and develop innovative technologies, by which an arbitrary manipulation of photons (light) and an ultimate control of electrons will be achieved, as we hold the motto of “challenge the limitations of current technology and create new functionalities”. In this year, we organized the international conference for young researchers and students and the seminar school for students “dojo”. Two ICR students visited several Universities and Research Institutes in Europe in this summer.



## “The Next Generation of Physics, Spun from Universality & Emergence —Developing Independent Researchers to Explore New Frontiers—”



The program of the Global Centers of Excellence (GCOE), funded by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), is organized by the members of the Division of Physics and Astronomy and its joint courses (the Kwasan and Hida Observatories, the Yukawa Institute for Theoretical Physics, the Institute for Chemical Research, and the Research Center for Low Temperature and Materials Sciences). From the ICR, the courses of Particle Beam Science, Laser Matter Interaction Science, and Atomic and Molecular Physics in the Advanced Research Center for Beam Science join this program.

The natural world to whose investigation we are dedicated consists of phenomena on unfathomably varying scales from elementary particles and atomic nuclei to

the macroscopic world of living organisms and our earth to the great variety of phenomena and physical laws that appear as qualitatively differing strata of nature. Corresponding to these individual strata there are separate fields of research, each possessing its own sets of concepts and theories.

In this Global COE, we seek to unite these seemingly independent realms by uncovering the fundamental universality extending across their boundaries, while searching for novel and diverse emergent phenomena that could not be predicted by deduction from such laws alone. The objective of the proposed GCOE is to make progress toward the construction of the next generation of physics, spun from universality and emergence, while developing independent-minded researchers who will be capable of opening new frontiers in the study of natural phenomena.

[http://www.scphys.kyoto-u.ac.jp/gcoe/index\\_e.html](http://www.scphys.kyoto-u.ac.jp/gcoe/index_e.html)



Representative from ICR:

■ Prof SAKABE, Shuji

Advanced Research Center for Beam Science  
—Laser Matter Interaction Science— →P.44

